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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RTID 0648-XC187

Final 2021 Marine Mammal Stock Assessment Reports

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; response to comments.

SUMMARY: As required by the Marine Mammal Protection Act (MMPA), NMFS has considered public comments for revisions of the 2021 marine mammal stock assessment reports (SARs). This notice announces the availability of 50 final 2021 SARs that were updated and finalized.

ADDRESSES: The 2021 Final SARs are available in electronic form via *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region*

Copies of the Alaska Regional SARs may be requested from Nancy Young, Alaska Fisheries Science Center; copies of the Atlantic, Gulf of Mexico, and Caribbean Regional SARs may be requested from Sean Hayes, Northeast Fisheries Science Center; and copies of the Pacific Regional SARs may be requested from Jim Carretta, Southwest Fisheries Science Center (see "**FOR FURTHER INFORMATION CONTACT**" below).

FOR FURTHER INFORMATION CONTACT: Zachary Schakner, Office of Science and Technology, 301-427-8106, *Zachary.Schakner@noaa.gov*; Nancy Young, 206-526-4297, *Nancy.Young@noaa.gov*, regarding Alaska regional stock assessments; Sean Hayes, 508-495-2362, *Sean.Hayes @noaa.gov*, regarding Atlantic, Gulf of Mexico, and

Caribbean regional stock assessments; or Jim Carretta, 858-546-7171, *Jim.Carretta@noaa.gov*, regarding Pacific regional stock assessments.

SUPPLEMENTARY INFORMATION:

Background

Section 117 of the MMPA (16 U.S.C. 1361 *et seq*.) requires NMFS and the U.S. Fish and Wildlife Service (FWS) to prepare stock assessments for each stock of marine mammals occurring in waters under the jurisdiction of the United States, including the U.S. Exclusive Economic Zone (EEZ). These SARs must contain information regarding the distribution and abundance of the stock, population growth rates and trends, estimates of annual human-caused mortality and serious injury (M/SI) from all sources, descriptions of the fisheries with which the stock interacts, and the status of the stock. Initial SARs were completed in 1995.

The MMPA requires NMFS and FWS to review the SARs at least annually for strategic stocks and stocks for which significant new information is available, and at least once every 3 years for non-strategic stocks. The term "strategic stock" means a marine mammal stock: (A) for which the level of direct human-caused mortality exceeds the potential biological removal level or potential biological removal rate PBR (defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population); (B) which, based on the best available scientific information, is declining and is likely to be listed as a threatened species under the Endangered Species Act (ESA) within the foreseeable future; or (C) which is listed as a threatened species or endangered species under the ESA or is designated as depleted under the MMPA. NMFS and FWS are required to revise a SAR if the status of the stock has changed or can be more accurately determined.

In order to ensure that marine mammal SARs constitute the best scientific information available, the updated SARs under NMFS's jurisdiction are peer-reviewed within NOAA Fisheries Science Centers and by members of three regional independent Scientific Review Groups (SRGs), established under the MMPA to independently advise NMFS and FWS. Because of the time it takes to review, revise, and assess available data, the period covered by the 2021 Final SARs is 2015 through 2019. While this results in a time lag, the extensive peer review process ensures the best scientific information is available in the SARs.

NMFS reviewed the status of all marine mammal strategic stocks and considered whether significant new information was available for all other stocks under NMFS' jurisdiction. As a result of this review, NMFS revised a total of 50 SARs in the Alaska, Atlantic, and Pacific regions to incorporate new information. The 2021 revisions to the SARs consist primarily of updated or revised human-caused M/SI estimates and updated abundance estimates. No stocks changed in status from "non-strategic" to "strategic." Three stocks (all Northern Gulf of Mexico Bay, Sound, and Estuary Common Bottlenose Dolphin stocks–Galveston Bay, East Bay, Trinity Bay stock; Mississippi River Delta stock; and Sabine Lake stock) changed in status from "strategic" to "non-strategic."

NMFS received comments on the draft 2021 SARs from the Marine Mammal Commission (Commission); the Department of Fisheries and Oceans Canada (DFO); the Makah Indian Tribe (Makah); the Washington Department of Fish and Wildlife (WDFW); the Oregon Department of Fish and Wildlife (ODFW); three fishing industry associations (Hawaii Longline Association (HLA), Maine Lobstermen's Association (MLA), and United Southeast Alaska Gillnetters (USAG)), and a coalition comment letter from two non-governmental organizations (Center for Biological Diversity and Whale and Dolphin Conservation, hereafter referred to as "CBD and WDC"). Responses to substantive comments are below. Responses to comments not related to the SARs are

not included. Comments suggesting editorial or minor clarifying changes were incorporated in the reports, but they are not included in the summary of comments and responses. In some cases, NMFS' responses state that comments would be considered or incorporated in future revisions of the SARs rather than being incorporated into the final 2021 SARs.

Comments on National Issues

Requirements of section 117

[Comment 1]: The Commission continues to be concerned about NMFS' performance in meeting several of the requirements of section 117 of the MMPA. Including the SARs revised in 2021, an Nmin estimate is lacking for 77 of the 252, or 31 percent, of identified stocks. The primary hindrance to full assessment of all stocks continues to be an ongoing lack of resources, including lack of access to vessel and aerial platforms from which population surveys are conducted. The Commission encourages NMFS' continued engagement and collaboration with other federal agencies that require basic information on marine mammal stocks, and the Commission reiterates its recommendation that these marine assessment programs continue to include appropriate personnel, logistical capability, and vessel time to allow for photo-identification, biopsy sampling, satellite tagging, acoustic monitoring and other efforts to increase the value of the core line-transect survey data collected.

Response: NMFS acknowledges the Commission's comment and will continue to prioritize our efforts for the collection of data to address outdated Nmin estimates, as resources allow.

[Comment 2]: The Commission comments that regarding trend analyses, guidance is needed on how population trend analyses should be performed, and how key uncertainties should be addressed. To address the reporting inconsistencies and lack of analyses, the Commission recommends that NMFS convene a workshop to develop

guidelines for data requirements and best practices for population trend analyses pursuant to section 117 of the MMPA. The Commission recommends that invited participants include scientists from the NMFS Science Centers, SRG members, and non-NMFS statisticians who might provide guidance and different perspectives.

Response: NMFS agrees that long-term time series trend analyses are useful, while also acknowledging that it is difficult to achieve the appropriate precision and accuracy needed to detect trends (Authier *et al.* 2020). NMFS will work to improve consistency across regions and provide best practices for trend analyses in the SARs. We plan to address this topic in a future GAMMS revision. In the short term, we appreciate the Commission's offer to help with a workshop and will consider the possibility of convening one, as resources allow.

[Comment 3]: NMFS' process for distinguishing serious from non-serious injury requires reporting information on human-caused events that result in injury to the animal. This includes detailed documentation of strikes of marine mammals by vessels. These data are listed in technical memoranda, which typically include summaries of human-caused mortalities and injuries. Data is stored within different NMFS programs, offices, and databases, such that there is no single source to query for all vessel strike data. This impedes the compilation of accurate data summaries and makes cross-regional comparisons of data challenging. Given that these data are being summarized separately by each region for reporting under the NMFS injury determination process, the Commission recommends that NMFS develop a system for centralizing all data on vessel strikes of marine mammals into a single, queryable source. This resource would have regional, national, and global value in understanding and mitigating risk of vessel strikes.

Response: NMFS agrees with the value of a centralized database for vessel strikes. We are working to create this and will keep the Commission updated on our progress.

[Comment 4]: The Commission is concerned about the references made to publications that are "in review" to support information in 12 of the draft SARs, particularly when addressing annual human-caused serious injury and mortality. Labeling a report as "in review" suggests that the underlying analysis has been completed and submitted for publication, but analyses could change prior to publication. Therefore, the Commission recommends that NMFS carefully consider whether it should base draft revisions to the SARs being considered for public comment on analyses that are still "in review." At a minimum, NMFS should make every attempt to make the underlying reports/publications available to the public during the comment period.

Response: Because SARs are considered to be influential scientific assessments, all scientific information used in support of the SARs should meet the peer review requirements described in the Office of Management and Budget (OMB) Bulletin on peer review and NOAA Information Quality Act guidelines to ensure the information is not only high quality but is available for management decisions in a timely fashion. The best scientific information available for any given time period covered in a SAR may not necessarily have been published or subjected to professional peer review prior to inclusion in a draft SAR, as this process can take months or years to complete. In other cases, data such as annual human-caused serious injury and mortality pertinent to assessments of stocks are routinely collected and analyzed, and while not always suitable for journal publication, we publish them as technical memoranda, annual reports, or memos to the record. These data, and methods are annually reviewed by the SRG, and NMFS considers this review to constitute peer review and to meet the requirements of the OMB Peer Review Bulletin and NOAA IQA guidelines.

Comments on Alaska Issues

Alaska Native subsistence takes

[Comment 5]: The Commission has repeatedly recommended that NMFS, in collaboration with its co-management partners, improve its monitoring and reporting of subsistence hunting in Alaska. The Commission notes that take levels are lacking for the majority of communities that hunt or may hunt ice seals and harbor seals and continues to recommend that NMFS find ways to gather reliable information on the numbers of marine mammals taken for subsistence and handicraft purposes through partnerships with existing and emerging co-management partners and the state of Alaska. Further, the Commission encourages NMFS to continue to provide updated information in the SARs whenever it becomes available, even if it pertains only to a few villages or a subset of years.

Response: NMFS agrees that it is important to collect reliable information on the numbers of marine mammals taken for subsistence and handicraft purposes. Funding for subsistence use surveys remains limited. In most cases, the best available data are not comprehensive. Nevertheless, we continue to work with our Alaska Native co-management partners (and the State of Alaska in some cases) to conduct surveys of subsistence use as resources allow, including animals struck and lost, and we incorporate that information into the SARs as it becomes available. In particular, we have encouraged the Alaska Department of Fish & Game to explore the feasibility of obtaining harvest information and biological samples of subsistence-harvested seals in communities where such data collection has not recently occurred. The Alaska Department of Fish & Game is pursuing this.

Eastern Bering Sea (EBS) Beluga Whales

[Comment 6]: The Commission understands that the final 2020 SAR for the Eastern Bering Sea (EBS) stock of beluga whales was withdrawn to allow for Tribal consultation. That SAR was not included in the draft reports for 2021. We await further

word from NMFS on whether that SAR will be included in the final 2021 SARs for Alaska.

Response: The EBS beluga whale SAR was not revised in 2021. After ongoing consultations with NMFS co-management partner, the Alaska Beluga Whale Committee (ABWC), NMFS has withdrawn the final 2020 EBS beluga whale SAR and anticipates releasing a revised draft SAR for the 2022 or 2023 SAR cycle. This has been noted on the NMFS SAR webpage *(https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-species-stock#cetaceans---small-whales*). Additionally, NMFS temporarily withdrew the final 2020 Beaufort Sea, Chukchi Sea, and Bristol Bay beluga whale SARs to review potential implications of the ABWC recommendations on the Eastern Bering Sea beluga whale SAR but republished them with an explanatory note indicating that any changes resulting from such a review will be reflected in a future SAR. As is our practice, we will include the most recently revised version of each Alaska SAR in the compiled final Alaska SARs. The most recent EBS beluga whale SAR is the final 2017 SAR.

NMFS is providing this information for awareness only and is not seeking public comment on the NMFS-ABWC co-management agreement nor the final 2020 EBS beluga whale SAR.

Southeast Alaska Harbor Porpoise

[Comment 7]: USAG is concerned that the areas of highest densities of harbor porpoises have not been surveyed and suggests that a more thorough survey would involve track lines that followed the edges of the straits, in shallower water, and include larger bays and inlets. Since the stock boundaries for SEAK extend from west of Yakutat to Dixon Entrance, USAG wonders why the outside waters were not surveyed in 2019. This would indicate that the population estimate could be biased low. USAG comments

that population survey would be best for the region if it included the coastal waters that were not included in 2019.

Response: In the 2019 survey, NMFS developed a protocol to sample the study area more thoroughly than ever before and to account for biases not previously considered in previous analyses. This protocol focused on:

Sampling the habitats in the main channels of SEAK where harbor porpoise has been historically documented, including shallower (close to shore) and deeper (middle of the channel) waters. Because sampling in these areas was proportional to the area of each habitat, estimates of density within these habitats are expected to be unbiased.

Approximately 40% of the area of inlets and small bays were sampled in response to previous criticism that NMFS' SEAK surveys did not cover these habitats. The results showed that only a small fraction (approximately 5-10%) of the population occurs in these areas in the summer.

Applying a correction factor to account for animals missed ("g(0) correction") developed with data from previous surveys in SEAK inland waters.

The fact that the 2019 survey had nearly 200 sightings of harbor porpoise suggests that the design implemented during the cruise did sample the species habitat within inland waters.

The SAR acknowledges that the estimate of abundance from inland waters is an underestimate for the whole stock because the outer coast between Cape Suckling and Dixon Entrance has not been sampled. The survey was limited to inside waters due to logistical and funding constraints. Sampling the outer coast is needed to develop a stock-wide estimate. Additional sampling for stock structure (e.g., environmental DNA (eDNA)) is also needed to assess the relationship of animals in the outer coast with those within inland waters.

[Comment 8]: USAG points out that the SARs include evidence of sub-populations of harbor porpoises. This is based on eDNA samples, with a notable difference between northern and southern parts of the region. Since the SEAK stock includes a large area, eDNA should be procured from all areas to further define sub-populations. There should also be eDNA collected in the Gulf of Alaska stock for comparison with the unique stocks in SEAK that may have been identified. USAG would question whether the samples were collected in a fashion that could have eliminated the possibility of familial relationships.

Response: The evidence supporting population differentiation among regions throughout coastal Alaska waters and within the currently recognized SEAK stock is based on genetic data generated from both eDNA samples and tissue samples collected from fisheries bycatch and beachcast strandings. Nuclear genetic data suggest a degree of genetic relatedness among harbor porpoises sampled within a region that is greater than we would expect by chance, suggesting genetic structure and likely natal philopatry. Mitochondrial genetic data, generated from both tissue and eDNA samples, indicate significant genetic differences between Gulf of Alaska and SEAK, as well as within SEAK. The majority of the samples represent nearshore coastal waters; however, some coastal regions are poorly represented, or unrepresented (*e.g.,* between Copper River and Yakutat).

Environmental DNA samples were collected as surface seawater in the fluke prints of submerging harbor porpoises from small boats in SEAK inshore waters. At this time, determining familial relationships is not feasible with eDNA samples. As a result, a conservative approach was adopted, counting each "discovered" unique genetic sequence from each eDNA sample only once. This strategy avoids over-representing mitochondrial haplotypes based on sequencing read depth but may underestimate genetic differentiation metrics if multiple related porpoises comprising the same mitochondrial haplotype co-

occur, as multiple related porpoises represented by genetic material in a single eDNA sample will only be counted as a singleton. The Gulf of Alaska stock is well represented by tissue samples throughout nearshore waters (*e.g.,* Cook Inlet and Copper River); however, coastal regions between SEAK and the Gulf of Alaska are unsampled and collecting samples from these regions will be very valuable for identifying key regions delimiting harbor porpoise stocks within SEAK and beyond.

[Comment 9]: USAG comments that the SAR notes that entanglement in fishing gear is the only known human cause of mortality, but there are other industrial fisheries being prosecuted in the region. To make the assumption that only one gear type interacts with a species that exists in the same habitat seems arbitrary. Charter boats, sport fishing, yachters, cruise ships, both large and small, and other water related outdoor excursions, have all increased substantially, and the USAG notes that ship strikes are a cause of mortality.

Response: NMFS agrees that harbor porpoise are difficult to see in the wild. We take the characteristics of the species into consideration when we design and execute our surveys. For example, we search for porpoise using binoculars, which allows for early detection. We only search in good visibility and oceanographic conditions. Before analysis, we inspect the data to assess whether there is evidence that animals are reacting to the boat. We only analyze data collected in relatively good observation conditions (*e.g.,* Beaufort sea state 3 or less). The elusive nature of harbor porpoises often results in animals or groups of animals being missed by observers. We therefore estimate the proportion of porpoise missed and add that to the estimates of density and abundance to minimize or eliminate any negative bias in the estimates.

The estimates of population size indicate abundance is stable in the northern portion of SEAK inland waters (*e.g.,* around Cross Sound, Icy Strait, and Glacier Bay),

but there is evidence of declines in the southern range of the species more towards the south, around Wrangell and Zarembo Island.

Other types of fisheries can result in M/SI; but, as noted in the comment, they have not been documented in SEAK. In other parts of the world, harbor porpoises are known to be extremely vulnerable to gillnets, and there is no reason to believe the situation is different in SEAK. This is one of the reasons the concern with this type of gillnet fishery is greater.

[Comment 10]: USAG emphasizes that the SEAK gillnet fishery has been fishing the same statistical waters since statehood, and those areas are a relatively small portion of the region. Portions of the areas SEAK gillnetters are permitted to fish are often closed to gillnetting for salmon management concerns, and other portions of those areas are not fished due to lack of productivity. Since 1975, with the inception of Limited Entry, USAG effort has been static. Given the lifespan of a harbor porpoise, USAG feels that it is safe to assume that any impact the gillnet fleet has had on the stock has likely happened. USAG notes there are no population estimates pre-statehood, so it would be impossible to determine just what impact commercial fishing has had on these animals since its inception.

Response: It is still unclear whether the population is stable in part of the range (near Wrangell and Zarembo Island). NMFS agrees that there is uncertainty with respect to the potential impact of fisheries to harbor porpoise and believes that additional data are needed to address this question.

[Comment 11]: In 2012 and 2013, the SEAK gillnet salmon fishery was observed in districts 6, 7, and 8. In 2012, there were 0 observed interactions with harbor porpoise. There were 2006.5 boat days for that particular season. In 2013, there were four observed interactions with harbor porpoises, two released alive, and two released, judged by the observer as significantly injured, likely resulting in a mortality. There were 2708.6 boat

days in 2013. This makes 2013 an anomaly in that USAG had several multi-day openings and more boats than normal fishing in the districts observed. USAG thinks this inflates the mortality associated with the gillnet fishery artificially.

Response: NMFS takes fishing effort into account when calculating a bycatch rate and estimating M/SI. This minimizes bias in the estimates given potential differences in effort across years (*e.g.,* between 2012 and 2013, as suggested in the comment). NMFS agrees that rare events, when observed, inflate the mortality estimate. However, the capture of four porpoise in a single year (2013) suggests that bycatch events, while rare, may be occurring at a frequency large enough to impact the population, particularly in areas where harbor porpoise occur in relatively large numbers such as around the Alaska Department of Fish & Game fishing districts 6, 7, and 8 in SEAK.

Comments on Atlantic Issues

[Comment 12]: Department of Fisheries and Oceans Canada (DFO) believes the reference number provided for electronic submission of comments on the draft SARs (NOAA-NMFS-2021-0130) is incorrect as it leads to the wrong docket.

Response: Thank you. Because of a technical error, we extended the public comment period two weeks and published a correction notice in the FR with the correct link for the appropriate docket.

Gray Seal

[Comment 13]: The Commission remains concerned that numerous known serious injuries of gray seals are not being accounted for in estimates of total M/SI. The 2021 draft SAR reports a PBR level of 1,458. Total reported annual M/SI in U.S. waters is 1,179 (1,169 of which were deaths caused by U.S. commercial fisheries). The Commission recommends that NMFS use the best available science when calculating the total estimated annual M/SI to account for these entanglements. Further, the Commission

encourages NMFS to work diligently to address this welfare issue and greatly reduce gray seal injuries and deaths in U.S. fisheries.

Response: NMFS recognizes that estimates of gray seal bycatch mainly reflect mortalities because observers rarely document live animals. Therefore, data derived from observer coverage do not reflect the numerous animals that are seen living with entanglements and that may eventually die as a result. Currently, there is not a system in place to document seals that are living with entanglements in the NMFS National Stranding database (live entangled cetaceans are recorded, but not pinnipeds). This policy decision was made primarily due to the inability to distinguish between individuals, resulting in uncertainty over whether an observed entangled animal was a unique case, or one seal observed multiple times over many years. NMFS is working to address this issue, including developing a customized database for tracking entanglements rather than the National Stranding database. We are also preliminarily planning to conduct entanglement surveys, as resources allow. The goal is to quantify the number of entangled animals at various haul-outs in a given day so that, at a minimum, we may add these to the bycatch estimates.

North Atlantic Right Whale

[Comment 14]: DFO comments that right whale #3893 was assigned as a Canadian mortality and was observed in U.S. waters on January 22, 2018, before being found dead on January 28, 2018. Prior to this, it was seen gear free in Canadian waters on July 29, 2017. No pictures or information about the gear analysis have been provided to assist in the Canadian analysis. DFO emphasizes this whale should be XU.

Right whale #3694 was "unidentified" prior to the 2020 SAR. Upon inquiry to NOAA, DFO received the following response: "Gear from #3694 was identified as Canadian snow crab by the NMFS Greater Atlantic Regional Fisheries Office, and this result was announced through an email to the Atlantic Large Whale Take Reduction

Team in April 2018." No information on this was provided to Canadian officials for review.

Response: The U.S. gear team reports that the recovered gear from right whale #3893 and #3694 are inconsistent with legal U.S. gear and are consistent with offshore Canadian trap/pot gear. Without new incident documentation or bilateral analysis, under longstanding NMFS protocols, NMFS would not change the current attribution. NMFS believes bilateral gear investigation of gear retrieved from entangled large whales in U.S. and Canadian waters would be invaluable to improve our understanding of at least that subset of entanglements that are observed and documented. NMFS will continue to pursue collaborative bilateral efforts on gear analysis and other fronts, toward improving science and management to help the U.S. and Canada develop additional solutions to reduce the impacts of our fisheries on endangered right whales.

[Comment 15]: For Right whale #4094, the gear was identified as Canadian crab pot in Daoust *et al.* Upon review of this report, no information was included to support this finding. Additionally, the DFO Marine Mammal Response archives have the following, "A live entangled North Atlantic right whale (NARW) was reported on July 19th, 2017 by NOAA Fisheries in the Gulf of St Lawrence. No response was performed as no action was permitted. No subsequent sightings were completed after this date." It is unclear how a determination was made if no response was performed. DFO believes this whale should be XC and NR.

DFO would like to suggest that the "points" for the serious injury associated with right whale #4057 be equally split (.5/.5) between Canada and the U.S. On August 13, 2016, #4057 was disentangled by the Campobello Whale Rescue Team. In their report they noted that the entanglement responded to impacted and exasperated old wounds from 2014. On February 16, 2014, #4057 was found near Florida dragging over 100

yards (91.44 meters) of heavy 9/16" diameter fishing rope. Responders from the Florida Fish and Wildlife Conservation Commission disentangled the whale the following day.

The gear for Right whale #3125 is attributed to Canada. DFO requests that the U.S. provide information on how the conclusive origin of the gear was determined in this case. If no review of the gear has been conducted, DFO concludes this whale should be XC.

Right whale #1226 is currently assigned "CN." DFO comments that this whale should be XC. The whale was sighted anchored alive in Canadian waters, and the carcass was later found without gear present.

Response: NMFS notes that #4094's gear attribution was based on identification of gear in the Daoust *et al.* report, which was co-authored by DFO staff. We would consider changing it to XC if the published incident report that identified the gear as Canadian snow crab is revised.

#4057 - The two events are evaluated separately in keeping with longstanding NMFS protocols. The 2014 incident was deemed not serious, assigned a 0 against PBR, and does not impact the current SARs because the time frame for the data is 2015-2019. The 2016 incident was deemed serious based on severe health decline despite disentanglement. U.S. gear experts report that Parks Canada confirmed the recovered gear to be Canadian snow crab.

#3125 - The U.S. gear team reports that the recovered gear from this event is inconsistent with legal U.S. gear and is consistent with Canadian snow crab gear. Without new incident documentation or bilateral analysis, under longstanding NMFS protocols, we would not change the current attribution.

#1226 - This whale was seen without gear in the Gulf of St Lawrence (GoSL) from June 9-July 21, 2019. The entanglement was observed in GoSL on August 6, 2019, when the whale was anchored alive. In keeping with longstanding NMFS protocols,

anchoring in place is considered evidence of incident location so this incident was assigned as a Canadian injury. Though no gear was present on the carcass on September 16, 2019, the documented fatal injuries on the carcass line up with the entanglement configuration documented on August 6, 2019. Injury was attributed to the August 6, 2019 entanglement.

[Comment 16]: MLA states that the Draft SAR fails to disclose key limits of the Pace model. The Pace model remains sensitive to new data, and its output is highly variable. Further, the period from 2011-2015, during which time NARW shifted their geographic distribution to areas lacking survey effort, may be producing an underestimate of the population.

MLA notes that the Draft SAR underweight the existence of natural predation as demonstrated by Taylor (2013), Curtis (2014), and Sharp (2019). MLA comments the SAR must cite relevant literature on natural mortality and discuss how the treatment of this significant factor affects population models. This estimate of total annual human-caused mortality may be somewhat positively biased (*i.e.,* a slight overestimate) given that some calf mortality is likely not human-caused." Although the Draft SAR acknowledges this is likely a "slight overestimate," its conclusion that all mortality is human-caused is not supported by Taylor (2013), Curtis (2014), and Sharp (2019). With natural causes constituting a total of 14.5 percent of all examined individuals and 25 percent of those incidents where cause was confirmed, this is more than a "slight overestimate," and the best available scientific information does not support attributing all calf and adult mortalities of unknown cause to human activity. MLA comments that the assumption that natural mortality is limited to newborn calves is without empirical justification and results in an overestimation of anthropogenic mortality.

Finally, Pace (2021) incorrectly assumes an equal sex ratio and probability of mortality. Neither of these assumptions are supported by the best available data.

Hamilton (2020) reports that through 2017, 94 percent of males have been entangled at least once compared to 87 percent of females. Males are known to make up a larger portion of the population and statistically more likely to encounter and become entangled in a vertical line. This, too, must be corrected or, at a minimum, disclosed to the public.

Response: The Pace *et al.* 2017 and slightly updated Pace 2021 Mark-Recapture-Resight MRR model has been reviewed and re-reviewed by both journal peer review process for publication as well as more than 6 years of Atlantic SRG meetings with rotating membership, meaning an additional 20 experts have reviewed the model and its contents are publicly available to review as the documents are cited within the SAR.

The MRR model published by Pace *et al.* 2017 uses standard well-verified methods of using sighting histories of individuals to estimate interval (in this case annual) capture probabilities which are allowed to vary at each interval. Indeed the estimated capture probabilities since 2011 of NARWs have shown considerable variation compared with the previous decade. The statistical methodology employed simultaneously estimates survival and capture rates to estimate the number of whales still alive thereby accommodating variable annual capture rates. Beyond that the MRR model used, unlike some of its predecessors, allows for individual animals to have unique catchability parameters thus reducing biases in capture rate found in simpler MRR models. Although there is no accommodation for permanent emigration, so far there has been no evidence that even modest numbers of NARW have permanently left all of the areas surveyed. Hence, the conservation conclusion is that the estimated survival rates presented in the SAR and reflected in the abundance estimates represent actual survival rates of the stock and not merely apparent survival rates.

On the issue of natural mortality, NMFS and the SAR acknowledge that some natural mortality of calves exists. However, there are no observations of adult mortality from natural causes. NMFS reviewed relevant data, existing models and the literature

with the Atlantic SRG on Sept 2, 2021 and requested guidance. The Atlantic SRG recommended NMFS continue to assign 100 percent of the mortalities of non-calf NARW to anthropogenic origins (Atlantic SRG letter to NMFS September 16, 2021).

[Comment 17]: The Draft 2021 SAR includes new text speculating that the probability of carcass recovery is higher for vessel strike events than entanglement events. MLA comments that there is presently no evidence to support such a finding, and the literature cited in the Draft SAR are not the results of empirical studies to inform this issue. MLA thinks it is equally, if not more likely, that the observed data with respect to carcass status as discussed in Pace (2021) are correct—that entanglements and vessel strikes kill whales in roughly equal proportions. MLA requests that NMFS remove this entire section until empirical data are available to inform the probability of carcass recovery for different modes of death.

Response: NMFS agrees that there is no empirical study showing that the bodies of whales dying from vessel strikes are more likely to be detected than the bodies of whales dying from entanglement. However, it is the intention of this stock assessment report to provide information on our current understanding of the right whale population, including trends in strandings data, and we will therefore continue to include this empirical information relevant to the probability of carcass recovery. We believe that including hypotheses that may explain the disparity between the proportion of detected entanglement and vessel strike serious injuries compared to the proportions by cause diagnosed for dead whales is relevant and informative. The Moore *et al.* (2020) hypothesis is founded in the physics of buoyancy on marine mammal bodies under different conditions. However, we agree that there is not currently sufficient basis to conclude that the proportion of observed serious injuries that were the result of entanglement reflect the correct apportionment of total mortalities. We also agree that there may be factors that increase the likelihood of detection of entanglement serious

injuries. We do not believe there is currently sufficient basis to assert that right whales struck by vessels are more likely to sink.

NMFS proposed many alternative scenarios to the Atlantic SRG (ASRG) on how best to apportion cryptic mortality (NMFS intersessional September 21, 2021). The ASRG recommended that the ratio between entangled and vessel struck NARW, calculated from documented observations of Serious Injuries and Mortalities over the last five years, be used to apportion cause. NMFS scientists will continue to work on improving our methods for apportioning these sources of mortality, and the ASRG will continue to consider better alternatives as they are developed.

[Comment 18]: MLA is concerned that the Draft SAR only reports total observed M/SI data without apportioning those observations between the U.S. and Canada. The Draft SAR does not present the annual mortality and serious injury estimates by each "fishery." MLA believes it is arbitrary for NMFS to ignore these data demonstrating that many more M/SI are occurring in Canadian fisheries than U.S. fisheries. MLA reiterates that NMFS should not rely on limited data to conclude that all cryptic mortality results from anthropogenic sources and that vessel strike carcass recovery is more likely than for entanglements.

Response: NMFS seeks to provide the maximum precision and resolution in apportioning all M/SI to cause -- whether fishery, vessel or other. However, there continues to be a distinct lack of information available to the agency to assign entanglement to fisheries based upon recovered gear. We believe expansion of gear marking and reporting requirements will assist us in this area moving forward. In addition, because right whales are able to travel thousands of miles in short periods of time, even when trailing gear, it is very difficult to attribute entanglement based upon the region of initial sighting.

NMFS has invested considerable effort developing better methods for apportioning M/SI to appropriate sources in light of increased mortality overall, including increasing observations in Canada. We are also working to improve our ability to quantify unseen mortality with consideration of if and how to apportion natural versus anthropogenic mortality. As part of this effort, the agency convened a special session of the Atlantic SRG in September 2021 for scientific and technical input. The Atlantic SRG supported its prior position that 100 percent of the mortalities of noncalf NARW should be considered to be of anthropogenic origin. The Atlantic SRG also considered the various approaches provided by NMFS for apportioning SIM between US and Canada but did not have enough information to provide a robust scientific alternative. They suggested alternatively, a fully fleshed out co-occurrence model for both US and Canadian waters could be used, but this is also not presently available. Given this data limitation, it would be arbitrary for NMFS to assign proportions without better data to support conclusions.

[Comment 19]: MLA notes that the NARW Draft SAR contains none of the statutorily required-information from Section 117 of the MMPA regarding entanglements in fishing gear. As a result, the public has no information about the fisheries that interact with the NARW and the levels, types, and seasonal and geographic patterns of entanglement that occur within and among those fisheries. MLA notes that the Draft SAR presents only M/SI entanglement data—non-serious injury entanglements are omitted. MLA requests that the SAR also include data on the severity of entanglements. MLA requests a more detailed table included in the SAR, since this information is important for assessing individual fisheries.

The Draft SAR cites three studies concluding that NARW mitigation measures implemented prior to 2009 have not worked and that the effectiveness of measures implemented since 2009 have not yet been evaluated. MLA comments that the SAR

should report data showing that there has been a 90 percent decline in instances of lobster gear removed from entangled NARW since 2010 based on observed data. There were four known cases of lobster gear removed from NARW from 1997 to 2000, six from 2000 to 2010, and one from 2010 to 2019. The only confirmed M/SI resulting from entanglement in lobster gear occurred in 2002. MLA requests that NMFS present information about the fact that the scarring data suggests most entanglements are minor.

Response: The fisheries are summarized in Appendix 3- Fishery Descriptions. NMFS cites our annual M/SI report for reported injuries during the time frame encompassed by the SAR. However, because only a small fraction of entanglements have gear recovered and a smaller fraction of those are traceable to the fishery, the agency has not been able to estimate the annual M/SI to the resolution of fishery/region. Given recommendations from the Atlantic SRG and additional analysis resulting from Pace *et al.* (2021), the agency is working to improve our understanding of this issue to the resolution requested above in future SARs. For now, this topic is addressed to the extent that data can support in table three of the SAR.

The issue of non-serious injuries is discussed in the third paragraph of the section titled "Fishery-Related Mortality and Serious Injury." The draft cites Knowlton *et al.* (2012), which reported 26 percent of the population being entangled each year and now includes Hamilton *et al.* (2019), which reports 30 percent of the population receiving non-serious injuries annually. This is an increasing trend. Despite roughly 100 injuries per year in recent years, they are almost never observed, but the wounds persist for periods of weeks to months/years during which time animals may travel thousands of miles. Therefore, the agency takes a conservative approach to not apportion injury by fishery or area where data are not available. Additional language to address this concern has been added to the first paragraph of the "Fishery-Related Mortality and Serious Injury" section of the SAR.

Regarding the "decline" in lobster gear removed from NARW, the SAR does not address this because it is not a metric supported by a rigorous sampling design with high probability of detection. Rather, it is anecdotal in nature with detection rates subject to numerous biases described above. The comment raises the similar "observed decline" in entanglements observed to be connected with groundline. However, despite some reason for optimism with both these observations, they are anecdotal in nature, and also in juxtaposition with the dramatic increase in mortality that has subsequently occurred. The SAR acknowledges these are from multiple sources across multiple regions. Because of this, the SAR focuses on the more appropriate metrics of total M/SI and cryptic mortality. In response that most injuries are "minor"- it should be noted that NMFS uses similar but slightly different criteria for the assignment of injury severity than New England Aquarium. The SAR does report the number of injuries which meet the criteria for "serious" under the NMFS criteria, and there has been an increase in serious injuries including entanglement for the past decade. The SAR addresses these "non-serious" injuries in the previous section, acknowledging that collectively they "should be considered to fully understand anthropogenic impacts to the population, especially in cases where females' fecundity may be affected."

[Comment 20]: MLA believes the SAR should include additional available scientific information about NARW behavior that affects its risk of harm from fishing gear. Recent scientific literature confirms that NARW have shifted their habitat usage away from the Maine lobster fishery. These findings were most recently summarized and reported in Meyer-Gutbrod (2021), which MLA expresses must be referenced and discussed in the Draft SAR.

Response: NMFS appreciates this comment and agrees with the distribution changes and observations characterized above. The Meyer-Gutbrod reference and some additional language have been added to the habitat section. However, NMFS believes

there is a flawed assumption that right whales are only subject to mortality when they are densely aggregated in foraging areas, and those areas are the only regions that should be managed for right whale conservation. In reality, portions of the NARW population are only aggregated in a few small regions during some parts of the year, and we are recognizing that our management measures need to be spatially resilient to reflect the documented acoustic presence of right whales across their entire range through much of the year, including the Gulf of Maine. Furthermore, given the high degree of surveillance in the areas of high aggregation and the comparative lack of surveillance in many other regions (aside from acoustics, which only detect vocalizing whales, and cannot detect mortality/injury), the agency is increasingly concerned that much of the unseen mortality is likely to be happening in areas where there is a high degree of risk from either fishing or vessel activity for solitary whales transiting through those regions. We have added additional language to reflect this in the habitat section.

[Comment 21]: MLA is concerned that the 2021 draft SAR omits important details describing NARW stock definition and geographic range. MLA believes the multiple references to right whale feeding grounds located in New England waters must specify that these important areas are located in southern New England. MLA thinks the Draft SAR incompletely cites the available data on mortality in Canadian waters and calving. MLA recommends the Draft SAR add a reference to Hamilton (2022), which provides important "insight into right whale calf survival, growth rates, and association patterns." MLA comments that the section summarizing M/SI from vessel strikes has the heading "Other Mortality" and also reiterates that the text and reference to Frazier (2005) be removed.

Response: The description of NARW feeding grounds reflects our current understanding and best available scientific information. Acoustic and visual monitoring

in the central Gulf of Maine indicates right whales are present in areas besides southern New England.

All mortalities are accounted for in Table 3. The spike of right whale mortalities in 2017 noted in the text is including all carcasses found that year in both U.S. and Canadian waters. The 2019 calf detection is included in the SAR text. The years 2020-2021 fall outside the reporting period for the 2021 SARs and are therefore not included in this report. The 2022 Hamilton paper was not available during the 2021 stock assessment report timeframe, but the findings will be incorporated into the 2022 report.

The "Other Mortality" heading has been a standard heading for stock assessment reports for all species. This suggestion will be forwarded to the editorial board for consideration. As the section opens with the sentence, "Vessel strikes are a major cause of mortality and injury to right whale" and discusses no other sources of mortality, NMFS has been diligent in informing the public of this threat to right whales.

NMFS appreciates the MLA catching this transcription error. Although NMFS believes that Fitzgerald (2018) best represents the current understanding of pedigree-informed abundance estimation, as noted in previous responses, Frasier (2005) has not been conclusively refuted. NMFS has restored Frasier (2005), and added Frasier et al. (2007), to the text and references of the final 2021 SAR.

NMFS believes the description of right whale distribution and movement in the SAR is as comprehensive and accurate as the data and available analyses currently allow.

[Comment 22]: MLA reiterates that Kenney (2018) should not be cited in the SAR. Specifically, the methods used in this study fail to account for basic biological processes—namely, natural death. Further, calves have natural mortality rates that are ignored during scenarios when they are included in this model. Additionally, Kenney (2018) assumes a constant calving rate of one calf per 5 years (0.2/yr), which is a vast oversimplification of the life history process of NARW, and the Kenney (2018) value of

the calving rate is far higher than the "best" current estimate of 0.04 in the Draft SAR. For these reasons, Kenney (2018) should not be cited in the SAR. If NMFS is going to continue to include citations of this study, then it must address these scientific points.

Response: The Kenney (2018) reference is a relevant, peer-reviewed study that helps provide context to the impacts of fishery-related mortality on the right whale population. The study does account for other mortality, removing only confirmed fishery-related deaths and serious injuries (likely to lead to death). Several scenarios are provided with varying levels of hypothetically-reduced entanglement mortality rates corresponding to degrees of compliance to MMPA regulations. While the paper presents a simple representation of complex processes, the model parameters are reasonable and the results are informative for the reader to appreciate the cumulative impact of entanglement on the population. Any element of natural mortality or other processes affecting the population other than documented entanglement mortality are accounted for by using the time series of abundance estimates as a baseline.

Inclusion of the unrealized calves in the paper is an acknowledgment of basic population biology, and the outsized effect of removing productive females on a population's trajectory cannot be ignored. Kenny (2018) treats this effect conservatively. Proven female calving intervals have varied between 3 and 10 years, but are primarily in the 3- to 7-year range, so the choice of a 5-year calving interval is well founded. The paper's total of 26 calves lost due to the deaths of 15 females over 27 years equals an unrealised population increase of much less than 0.01/yr (1 divided by the average annual population size), and this undoubtedly underrepresents the actual value given that only known females documented as mortalities or serious injuries were used in the analysis.

[Comment 23]: CBD and WDC take issue with the statement which currently reads "In addition, right whales apparently abandoned the central Gulf of Maine in winter (see Cole *et al*. 2013) . . . ." CBD and WDC do not believe it is accurate to indicate that

right whales have abandoned the central Gulf of Maine during winter months. In fact, acoustic detections in the central Gulf of Maine have been documented during the winter for the past several years. In addition, CBD and WDC recommend the section regarding high resolution genetic profiling as it relates to parentage and relatedness be updated using Hamilton *et al.* 2022.

Response: NMFS agrees that new, widespread acoustic monitoring has changed our assessment of right whale presence and will adjust the text to reflect this fact. We will evaluate Hamilton *et al.* 2022 in the subsequent SAR cycle since its publication occurred during the finalization of the 2021 SARs.

[Comment 24]:CBD and WDC ask NMFS to include the findings in the recently published NARW (*Eubalaena glacialis*) Vessel Speed Rule Assessment which concluded that voluntary measures did not have a meaningful impact, small vessel collisions can seriously injure right whales, and the current SMAs should be modified.

Response: In general, NMFS limits the content of the SARs to the statutory requirements of section 117. The SAR is not intended to evaluate or discuss the merits of specific management activities. The SAR acknowledges that vessel strikes remain a serious issue for right whales; and, for transparency, the vessel size class involved in lethal strike events is always noted, if known. In addition, the NARW (*Eubalaena glacialis*) Vessel Speed Rule Assessment is posted on the NMFS website and easily accessible to the public.

Bryde's whale, Gulf of Mexico stock (Rice's whale)

[Comment 25]: While CBD and WDC appreciate the extensive updates to the 2020 Gulf of Mexico Bryde's whale SAR, this species was not updated in the recent 2021 draft. CBD and WDC remind NMFS that, as an ESA-listed species, the SAR for these whales should be updated every year. CBD and WDC also reiterate introductory comments on the general timing of review and public comment for the SARs and the

substantial delay in including new information, as it is now known that these whales have been designated a new species: Rice's whales. CBD and WDC request that this new designation be recognized and the 2021 SAR updated accordingly.

Response: The statutory requirement does not require the SAR to be updated every year, but to be reviewed annually. In regard to the updated designation, on August 23, 2021, NMFS published a direct final rule to update the taxonomic classification, description, and common name of species included in the list of endangered species maintained at 50 CFR 224.101 to reflect the updated science (86 FR 47022). The direct final rule changed the common name of the listed entity from Bryde's whale (Gulf of Mexico subspecies) to Rice's whale, the scientific name from *B. edeni* (unnamed subspecies) to *B. ricei*, and the description of the listed entity from Bryde's whales that breed and feed in the Gulf of Mexico to the entire species. The direct final rule and these changes became effective on October 22, 2021. This change became effective too late for an update to the draft 2021 SARs, but the draft 2022 SAR has been updated accordingly to reflect the revised taxonomy.

Comments on Pacific Issues

Hawaiian Monk Seal

[Comment 26]: CBD and WDC oppose NMFS categorizing fisheries interactions with Hawaiian monk seals as non-serious when the national guidelines would recommend the "serious injury" category. This is a problem especially because NMFS does not adequately consider the cumulative and chronic impacts of entanglements on Hawaiian monk seals. The draft SARs rely on Mercer 2021, which gives details on the two cases. Reclassifying these injuries from fishing gear as non-serious fails to account for the cumulative impacts of chronic entanglements. Entanglements make marine mammals more vulnerable to other sources of mortality, including disease. It is premature to deviate from the serious injury guidelines to reclassify incidents as non-serious before

NMFS adequately assesses cumulative and chronic entanglement impacts for Hawaiian monk seals.

Response: NMFS appreciates this comment and notes that determinations follow the NMFS' policy and procedural directive for distinguishing serious from non-serious injuries.

Hawaii False Killer Whale

[Comment 27]: HLA appreciates NMFS' acknowledgment that "timely publication of results that inform SARs is important" and hopes that similar delays will not occur in the future. HLA reiterates that the Draft 2021 SAR shows that the deep-set fishery's M/SI rate for the Hawaii Pelagic False Killer Whale (FKW) Stock (Pelagic Stock) is well below the stock's PBR. HLA believes the Pelagic Stock has never been "strategic" because the deep-set fishery's M/SI rate has never exceeded a PBR based on those abundances. HLA comments there is no legal basis to include the Pelagic Stock within the scope of the Take Reduction team (TRT).

In addition, NMFS did state in response to comments on the Draft 2020 SAR that NMFS cannot determine trend information for the Pelagic Stock based upon the three comprehensive surveys it has performed in the EEZ over a 15-year timeframe, along with multiple modeling exercises (performed over periods of years). HLA emphasizes that there are no data available supporting the notion that the stock has declined over time.

Response: NMFS uses the best available science at the time it is available to inform each SAR and support management actions. Subsequent years of data collection and analysis effort and refinement produce newer estimates of pelagic false killer whale abundance. These current estimates now represent the best available science. However, at the time the False Killer Whale Take Reduction Team (FKWTRT) was established in 2010, the pelagic stock of false killer whales was strategic and met the trigger for convening a take reduction team per MMPA section 118(f).

NMFS maintains that a temporal trend in the estimates of pelagic stock abundance cannot be determined because of the confounding effect of random variation in the encounter rate. As explained in Bradford *et al.* (2020), the model-based approach minimizes the effect of annual sampling variability but assumes that there are no underlying temporal trends in abundance aside from those predicted by habitat changes. While model-based methods can be used to estimate population trends, more data are needed to do so for pelagic false killer whales. Since a trend cannot be estimated, there is no basis to definitively state that the population is not declining. Anecdotal accounts cannot be used to infer population status. Metrics that can be quantitatively derived (*e.g.,* depredation rates) would need to control for other factors (*e.g.,* cultural transmission rates) for which there are currently no data.

[Comment 28]: HLA disagrees with NMFS' assignment of a recovery factor of 0.5 to the Pelagic Stock, which is the value typically assigned to depleted or threatened stocks, or stocks of unknown status, with a mortality estimate Coefficient of Variation of 0.3 or less. HLA comments that the Pelagic Stock is not depleted or threatened, its status is not unknown, and it has never qualified as a "strategic stock." Accordingly, all of the available data contradict any hypothesis that the Pelagic Stock is decreasing or otherwise not at its optimum sustainable population. HLA believes NMFS' assignment of a recovery factor of 0.5 to the stock is therefore arbitrary and not consistent with the best available scientific information.

Response: The status of the pelagic false killer whale population relative to its optimum sustainable population size is unknown, and a temporal trend cannot be estimated as explained in the previous response. The Guidelines for Assessing Marine Mammal Stocks indicate that stocks of unknown status should use a recovery factor of 0.5 based on results of previous simulation studies (Wade 1998) designed to evaluate the ability of the PBR management scheme to achieve the conservation goals of the MMPA

in the face of uncertainty. The guidelines further state that for stocks of unknown status, recovery factors of 1.0 should be reserved for cases where there is assurance that the minimum population estimate (N_{min}), the maximum net productivity rate (R_{max}), and the estimates of mortality and serious injury are unbiased and where the stock structure is unequivocal, which is not the case for pelagic false killer whales. NMFS notes that more recent simulation work supports these guidelines (Punt *et al.* 2020) and that the recovery factor is not linked to a specific abundance level or a stock designation of "strategic" or "depleted."

[Comment 29]:HLA comments that the population estimate for the Main Hawaiian Islands insular FKW stock inappropriately reflects the abundance of animals in only a portion of the Insular Stock's range. The 2021 Draft SAR estimates the Main Hawaiian Islands insular FKW stock ("Insular Stock") abundance to be 167 animals, based upon Bradford *et al.* (2018), which found that the population size of the Insular Stock in certain study areas has consistently ranged between 144 and 187 animals over a 16-year period. Bradford *et al.* (2018) concludes that (1) the study on which the Insular Stock abundance estimate is based did not sample the entire range of the stock and (2) the population estimate underestimates the abundance to an unknown degree.

The MMPA requires the SAR to "describe the geographic range of the affected stock" and to provide minimum population estimate for "such stock" (not a "portion of such stock"). 6 U.S.C. § 1386(a). NMFS has made no attempt to estimate the abundance of the Insular Stock across its range or to apply "appropriate correction factors" to do so.

Response: Mark-recapture estimation does not require the full range of a population to be sampled. Thus, Bradford *et al.* (2018) indicated that the partial sample of main Hawaiian Island insular false killer whales would not be problematic if all distinctive individuals in the population used the sampled area at some point. This assumption could not be evaluated, so Bradford *et al.* (2018) indicated that the true

abundance of distinctive individuals in each year may be underestimated. The text from Bradford *et al.* (2018) that was omitted from the second paragraph (*i.e.,* "...it is likely that all individuals in the population have been exposed to sampling efforts at some point during the study period…") is not speculation, but rather inference from movement analyses of satellite-tagged false killer whales (Baird *et al.* 2010, 2012). The number of satellite tag deployments on main Hawaiian Islands insular false killer whales has almost doubled since the Baird *et al.* (2012) study, and movement tracks from these individuals and fitted utilization distributions continue to reflect a lack of spatially-restricted use, such that individuals could be subject to sampling at some point during the sampling period. These utilization distributions are currently being used in an updated analysis of main Hawaiian Island insular false killer whale abundance that accounts for animal availability and the spatial bias in sampling.

[Comment 30]: HLA disagrees with NMFS' decision to apportion a small amount of "take" by the deep-set fishery to the Insular Stock despite the fact that there has never been a recorded interaction between the deep-set fishery and the (the "Insular Stock") and the fact that the fishery operates almost exclusively outside the Insular Stock's range. HLA continues to disagree with this approach for the reasons it has previously stated and incorporates those previous comments by reference.

HLA also reiterates its position that this type of overly conservative decision, which has no support in the best available science, undermines the integrity of the TRT process and decreases the fishing industry's motivation for participation in that process. Finally, in its responses to comments on the Draft 2020 SAR, NMFS agreed that it "can more explicitly state that no confirmed MHI insular false killer whales have been observed as taken in [the deep-set] fishery." 86 FR 38991 (July 23, 2021). HLA requests that NMFS do so in the final SAR.

Response: NMFS reiterates its response to this same comment from the 2020 Draft SARs. NMFS' Observer Program does not observe every deep-set trip. With ~20 percent coverage, some statistical extrapolation/approximation of what is observed is required. False killer whale takes are relatively rare. The rarity of observed takes together with the sampling design mean that the lack of observation does not equate to the lack of actual interactions. NMFS is not attributing interactions that occur outside of the MHI insular stock area to the MHI insular stock. We are prorating the estimated portion of the take to account for fishing effort that occurs within the MHI insular stock range and based on the relative density of the false killer whale stocks in this area. In reality, if an MHI insular false killer whale were taken by the fishery, we would very likely be underestimating the impact on this stock given our current proration method.

Further, although NMFS noted that we can more explicitly state that no confirmed MHI insular false killer whales have been observed as taken in this fishery, the overlap between the 2020 SAR comment period and the preparation of the 2021 draft SAR precluded this change. We will add this note, with previously noted caveat that very few of the observed takes are identified to stock due to the lack of tissue samples or adequate photographs.

Southern Resident Killer whale (SRKW)

[Comment 31]: CBD and WDC reiterate that NMFS update its protocol of using a July deadline for its annual census. We once again ask NMFS to update the protocol to reflect this shift in timing and to capture the most complete population count possible in a year by setting a December date and remind NMFS again that a July deadline reflects a number more than a year and a half out of date currently, and six months out of date for the SAR.

There are two updated regulatory measures that should be included in this SAR: the final rule for the revision of critical habitat should be noted in place of the reference

to the proposed rule, and Washington State has issued new vessel guidelines requiring a distance of 300 yards (274 meters) from the sides and 400 yards (365.76 meters) in front or behind a group of SRKWs, and a vessel speed of 7 knots within a 1⁄2 mile (0.8 km) of the whales.

New research on the SRKW population should be included in this SAR. Additional data from Hanson *et al.* (2018) is available on passive acoustic monitoring in coastal waters. Updated analysis on coastal prey sampling has been completed and is no longer "in press" – Hanson *et al.* (2021). New studies on body condition (Fearnbach *et al.* 2018) and adult sizes (Groskreutz *et al.* 2019) provide additional information on the impacts of prey depletion on the health of SRKWs. NMFS and the Washington Department of Fish and Wildlife have also completed a report on Priority Chinook Stocks that should be noted.

Response: With regard to the timing and reporting of census numbers, NMFS has previously addressed this same public comment (86 FR 38991, July 23, 2021). The Hanson *et al.* (in press) reference has been updated to Hanson et al. (2021). We will update the revision of critical habitat as well as the updated information on body condition and prey in the subsequent SAR cycle.

Humpback whale, CA/OR/WA

[Comment 32]: WDFW, Washington Dungeness Crab Fishermen's Association (WDCFA), and the Makah Tribe note the characterization of the distinct population segment (DPS) composition of humpback whales occurring in the stock is inconsistent with other NOAA reports. Regarding the text in the Draft 2021 SAR that describes the proportion of DPSs designated under the ESA for humpback whales by breeding grounds that utilize feeding grounds off the coast of Washington and southern British Columbia: The Draft 2021 SAR states, as previous SARs have stated, "The northern Washington and southern British Columbia feeding group includes primarily threatened Mexico DPS

whales, with smaller numbers from the unlisted Hawaii DPS and endangered Central America DPS." It is not clear where this characterization was originally derived from, as no reference is provided. This characterization of most of the whales in Washington coming from the threatened Mexico DPS is inconsistent with estimates provided by NOAA scientists to the International Whaling Commission. Furthermore, this statement is in conflict with a memo released by NMFS in July 2021, which states that the proposed approach for evaluating impacts to listed DPSs in ESA section 7 consultations (and in all relevant ESA analyses) would consider DPS proportions for humpback whales foraging off of northern Washington and southern BC derived from Wade (2021). The numbers included in the memo do not align with the characterization in the Draft 2021 SAR. The text in the report should be updated to reflect Wade as the best available science on the migratory destination of North Pacific humpback whales.

Response: NMFS will replace the following language "The northern Washington and southern British Columbia feeding group includes primarily threatened Mexico DPS whales, with smaller numbers from the unlisted Hawaii DPS and endangered Central America DPS" with findings from Wade (2021): "Based on a Pacific-wide photo-ID effort in 2004-2006, Wade (2021) reported that of 180 unique whale identifications from the Southern British Columbia - Washington stratum ("SBC/WA"), 28 were matched to Mexico wintering areas, 19 to Hawai'i, and 3 to Central America. Wade (2021) also estimated movement probabilities from the SBC/WA stratum to each wintering area. The highest movement probabilities were between SBC/WA and Hawai'i (0.688), followed by SBC/WA and Mexico (0.254), and SBC/WA and Central America (0.059)."

[Comment 33]: WDFW and the Makah Tribe comment that the draft 2021 SAR relies heavily on Calambokidis and Barlow (2020) to provide the minimum population (stock) abundance estimate (*i.e.,* 4,776 animals) and will be used for practical/regulatory purposes (*e.g.,* assessing the impacts of anthropogenic activities). Our primary concern

with respect to the use of Calambokidis and Barlow (2020) for providing an authoritative minimum abundance estimate for the stock comes from the fact that it does not consider sightings data collected off the coast of Washington. This is especially concerning because the genetic makeup of the feeding aggregation (in terms of DPSs or Demographically Independent Populations--DIPs) off of WA and SBC is significantly different from that of the CA/OR feeding aggregation. A minimum abundance estimate for the entire CA/OR/WA stock should include an estimate of animals found off the coast of Washington (animals that belong to the WA/SBC feeding group).

WDFW respectfully requests a comparative analysis of the assumptions and precision of each of these estimates, as this would increase transparency and improve the public's understanding of this important process for determining the best available science. WDFW also requests NMFS find some way to derive Nmin that more precisely accounts for humpback whales found off the coast of Washington.

Response: NMFS cites and compares two abundance estimates (Becker *et al.* 2020, Calambokidis and Barlow 2020) in the draft humpback whale SAR. The Becker *et al.* (2020) estimate is based on line-transect survey efforts that included Washington state waters (Becker *et al.* 2020), and for which the estimate is approximately 200 whales lower than the Calambokidis and Barlow (2020) estimate. While the lower estimate of Becker *et al.* (2020) could be used to represent CA + OR + WA abundance in this SAR, the mark-recapture estimate of Calambokidis and Barlow (2020) is used, for reasons given in the SAR.

[Comment 34]: WDFW staff, in coordination with Oregon and California Departments of Fish and Wildlife (ODFW and CDFW) staff, reviewed the Draft 2021 SAR alongside the 2021 M&SI Report (Carretta *et al.* 2021) and the most up-to-date version of the West Coast Region entanglement database currently available to state

agencies. Multiple inconsistencies were identified, and WDFW concurs with the comments provided by ODFW regarding these inconsistencies.

Response: NMFS reviewed the draft SAR and M/SI report and revised the values consistent between the SAR narrative and M/SI report totals. Totals that appear in the M/SI report may not agree with West Coast Region entanglement reports, as the latter is released months in advance of the preparation of the annual M/SI report. During that period, additional details or evidence regarding entanglements may come to light that result in addition or deletion of cases.

[Comment 35]: CBD and WDC request that NMFS revise the CA/OR/WA humpback stock so as not to aggregate two demographically independent populations that do not interbreed when mature. The current draft 2021 SAR does not reference these papers or provide hypothetical stocks if each were separate stocks. The draft SAR misleadingly includes information from Calambokidis and Barlow (2020) about an apparent increase in abundance from 2014 to 2018. Including appropriate caveats to the apparent increase in the CA/OR/WA stock is important because they explain that the increase may not apply to the DIPs. The draft SARs do not include scientific information regarding the accuracy of determining to which DIP or DPS a whale belongs based on photographic identification. There is genetic evidence that animals that are photographically identified as wintering in mainland Mexico-feeding off California/Oregon are not representative of that herd. It is not clear that photo identification will accurately assess the ESA-listed Central America DPS and Mexico DPS. CBD and WDC request adequate funding to meet the MMPA mandates for completing stock assessment reports.

Response: The draft 2021 SARs were prepared before the referenced Technical Memoranda were published. New information on multiple demographically independent

humpback populations and their status in U.S. west coast waters will be addressed in the 2022 draft SARs.

[Comment 36]: CBD and WDC recognize that one important function of the SARs is enumerating serious injury and mortality for each stock, and this is especially critical for ESA-listed humpback whales vulnerable to vessel collisions off California. The draft SAR includes Rockwood *et al.* (2017) but not more recent research available. A 2019 follow-up to Rockwood *et al.* (2017) concluded that even the 2017 study estimates were an underestimate, particularly in relation to humpback whale mortality during winter months. Table 1 of the Rockwood *et al.* (2021) paper allows the results from the 2017 paper to be comparable to the results of the paper. This information on ship strike mortality and injury should be updated in the humpback whale SAR.

Response: Rockwood *et al.* (2021) did not estimate vessel strike deaths for the entire U.S. EEZ as they did in the 2017 publication, though they compare estimates for Southern California between the two studies. The increase in estimates for Southern California between the two studies does not translate to an increase over the whole study area, thus it is unclear how the new estimates for Southern California (including new winter estimates) may be incorporated into the SAR, when estimates from the remainder of the U.S. EEZ are lacking. It is also unclear how winter/spring estimates of humpback whale vessel strike deaths can be higher than summer/autumn estimates for the same region, when humpback whales are more abundant in this region in summer and autumn. NMFS will consult with the authors on how the new results may directly apply to future SARs.

[Comment 37]: CBD and WDC recommend that the SAR should also note the impacts from marine heat waves and changing ocean conditions under Habitat Concerns. Warmer ocean temperatures influence primary prey choice by humpback whales and

creates shifts in distribution and habitat use, which may increase risk of human interaction.

Response: NMFS has added language to the Habitat Concerns section with regard to marine heat waves. “The impacts of marine heatwaves on the foraging activities of humpback whales, including changes in the abundance and distribution of prey and whale foraging locations, may increase risk of human interactions (Santora *et al.* 2020).”

[Comment 38]: WDCFA and the Makah Tribe are concerned that the abundance of SBC/WA populations is not included in the west coast abundance estimates. The excluded population of the SBC/WA population is in the order of 1,593 distinct animals and is not factored into the total of what the 2021 SAR characterizes as coast wide abundance estimated at 4,973, which produces an N_{min} of 4,776. While a portion of the SBC/WA population is international in range a significant portion of that population occurs off of WA and should be accounted for in the west coast (CA/OR/WA) population. A more accurate abundance estimate would benefit from and be more reflective of population abundance from a proportional inclusion of SBC/WA populations.

Response: NMFS notes that whales summering in NBC/WA waters are not considered a separate “stock” under the MMPA, as stated by the commenter. With respect to the estimate of 4,973 (CV=0.048) whales for CA + OR + WA waters by Calambokidis and Barlow (2020), they state: “While this estimate was calculated using identifications from California and Oregon, it likely incorporates the smaller number of Washington animals since there is some level of interchange with that area and adding our estimate for Washington-Southern British Columbia would likely be biased high both for that reason as well as because it would inappropriately (for purpose of calculating an N_{min} for US waters) include whales outside US waters.” The only other independent estimate of abundance for CA + OR + WA waters combined is 4,784 (CV=0.31) (Becker

et al. 2020), and it is lower than the mark-recapture estimate of Calambokidis and Barlow (2020). The Becker et al. (2020) estimate *could* be used in the SAR, but the mark-recapture estimate is considered the best estimate for management purposes for reasons given in the SAR.

[Comment 39]: The data for consideration in this SARs report on Pacific coast Humpback activity was gathered in 2018. WDCFA is concerned about how long it takes to get data processed and analyzed so that stakeholders and fisheries managers can make timely and well-informed decisions on practices that may impact the well being of stakeholders who make a living from the sea and the well being of the marine species that share ocean space with us.

Response: Data on the abundance of humpback whales were collected during a line-transect and mark-recapture survey in the past several years. It takes 1-2 years to analyze and publish these data for use in SARs. Guidelines for preparing marine mammal stock assessments note that abundance estimates are considered valid for use in SARs for an 8-year period after being collected.

[Comment 40]: The Makah Tribe has two concerns with the use of 8 percent for the maximum net productivity rate. First, the 8 percent is determined based on the observed rate of increase of humpback whales on the U.S. west coast and is not the maximum net productivity rate required by the formula for PBR. In the absence of a model with anthropogenic mortality included, the best available science indicates that an 11.8 percent growth rate should be used as the maximum theoretical or estimated net productivity rate in calculating PBR for the CA/OR/WA stock of humpback whales. The Makah Tribe also note that Calambokidis and Barlow calculated an observed growth rate of 8.2 percent per year from the 1980s to the current best estimate of CA/OR humpback whales. Thus, even if NOAA decides to use an observed growth rate for purposes of the SAR, the rate should be increased to 8.2 percent.

Response: Guidelines for preparing marine mammal stock assessments note that default rates of Rmax should be used in the absence of stock-specific measured rates. The guidelines also note that "to be consistent with a risk-averse approach, these default values should be near the lower range of measured or theoretical values." The Rmax of 11.8 percent noted in the comment is taken from the upper 99th quantile of the results reported by Zerbini *et al.* (2010) which does not reflect the lower range of the theoretical values reported. It also does not represent a stock-specific estimate of increase. The impacts of anthropogenic removals on estimates of Rmax has not been estimated for humpback whales; thus, observed rates of increase have been used in the SARs. The commenter is correct that Calambokidis and Barlow (2020) note that an 8.2 percent growth rate is implied for U.S. west coast humpback whales, based on rates of increase shown since the late 1980s. NMFS has updated the Rmax estimate to 8.2 percent in the final 2021 SAR.

[Comment 41]: The Makah Tribe notes that the assumption that the stock spends 50 percent of its time outside of US waters is too low. Modeled ship strikes should not be counted against the potential biological removal. The Makah Tribe suggests that it is best to compare the PBR to observed rates of ship strikes because the actual reports can be validated, whereas the modeled rates may not be accurate.

Response: NMFS will review the available data with regard to how much time this stock spends outside of U.S. west coast waters, as resources allow. The 50 percent proration factor has been used in the SAR for many years but can be improved. The vessel strike estimates of Rockwood et al. are considered as any other published estimates of anthropogenic removals might be in a SAR, including bycatch estimates. The commenter does not make a defensible case for why estimates of vessel strike deaths should be excluded from the SAR.

Blue whale, Eastern North Pacific

[Comment 42]: CBD and WDC comment that the changes NMFS proposes to the section on "Current Population Trend" do not seem to reflect the concern among the Pacific SRG regarding the large declining trend in the species distribution model (SDM) abundance estimates. Also, CBD and WDC are concerned that the draft SAR does not adequately explain the choice to adopt the mark-recapture estimate (1,898, CV=0.085) rather than the SDM estimate (670, CV=0.43). The results of the SDM show a declining trend and a worrisome low estimate of abundance for blue whales, which could easily be explained by an actual decline in the blue whale population. The lack of consideration of the blue whale SDM estimate stands in contrast to the adoption of the SDM results for fin whale abundances estimates. If the agency's explanation is that it favors mark-recapture estimates over line-transect or SDM for transboundary stocks, this should be more fully developed in the draft SARs.

Response: NMFS has been consistent in favoring mark-recapture abundance estimates over line-transect estimates (or SDM estimates derived from line-transect surveys) in SARs when 1) the precision of the mark-recapture estimate is superior and data were collected over a sufficient time period; 2) the line-transect survey effort is spatially-reduced compared with previous surveys, as was the case in 2018 (Becker *et al.* 2020); or 3) the line-transect estimate is outdated. When available, the mark-recapture estimates have been used in the blue whale SAR since 2009. In the case of fin whales, the SDM estimate of Becker et al. (2020) is used because it represents the only recent estimate, compared with the older line-transect trend estimates from Moore and Barlow (2011) and Nadeem *et al.* (2016), and there are no mark-recapture estimates for fin whales in this region. For blue whales, use of the Calambokidis and Barlow (2020) mark-recapture estimate is explained in the draft SAR as being due to its superior precision over the SDM estimate and the fact that the SDM estimate is spatially and seasonally constrained: "The mark-recapture estimate (1,898) is considered the best estimate of

abundance for 2018 due to its higher precision and because estimates based on line-transect data reflect only animal densities within the study area at the time surveys are conducted." Given that spatially-constrained line-transect abundance estimates have declined while mark-recapture estimates have increased, it is not irrational to assume that some portion of the blue whale population is outside of the U.S. EEZ during summer / autumn surveys or that their distribution has shifted north over time, as the SAR outlines with multiple published references. One of these references (Monnahan *et al.* 2015) notes that this blue whale population may have been near carrying capacity in 2013. Given the uncertainty from all of these sources, the SAR conservatively states that "the current population trend is unknown."

[Comment 43]: ODFW notes that Table 1 in the blue whale Draft SAR shows 2 serious injuries attributed to CA Dungeness crab gear (2 M&SI total). The M&SI Report shows 3 entanglements involving CA Dungeness crab gear that resulted in 2.75 serious injuries (2.75 M&SI total). This also results in a different total M&SI from human-related interactions in the Draft SAR (10.75 M&SI total) and the M&SI Report (11.5 M&SI total).

Response: Totals have been corrected in the final SAR.

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